USER MANUAL

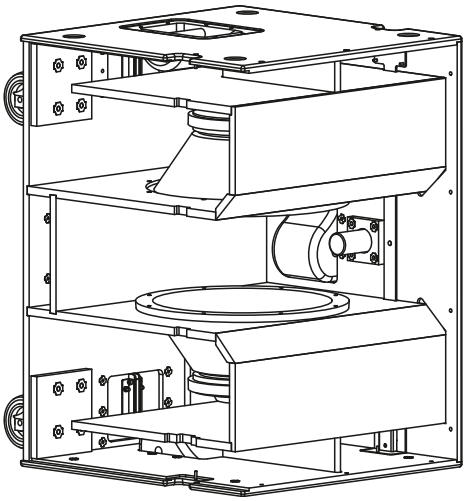
SW215A

active subwoofer

KEY FEATURES

- Very High Output
- Compact size for a very good output-to-weight ratio
- Digitally controlled Class D amplifier module with SMPS
- Manifolded Transmission Line configuration for very fast transient response
- 96KHz / 40 bit floating point CORE processing with PRONET remote control

INTRODUCTION



The SW215A subwoofer is designed to deliver high quality low frequency reproduction where very high output is a key requirement, together with well defined deep bass response and fast transient response. Its compact size and light weight make it suitable for several different uses, ranging from touring applications to fixed installations and high-level dance clubs.

The SW215A is a very high quality powered subwoofer system featuring some of the most advanced technologies for low frequency reproduction. Its unique and innovative design is based on a configuration that can be defined as Manifolded Transmission Line.

It uses manifolding of the front side of the cones to maximize the mutual coupling between the two drivers, while loading the back of the cone with a large-size transmission line that has the function to create a transmission path from the back of the transducers to the front.

The SW215A subwoofer system is equipped with two high power 15" (380mm) transducers capable of long excursion (up to 33mm peak-to-peak), controlled by high stiffness Double Silicon Spider as centering suspension and by heavy duty surround. The motor structure features high strength (BL^2/Re) with optimized symmetry and excursion controlled by Aluminium Demodulating Ring. The robust copper 75mm (3") voice coil is wounded in two different layers both outside and inside the coil support, then doubling the coil surface exposed to air cooling and consequently improving the long term thermal capacity of the loudspeaker. Cones are made of very high-stiffness reinforced paper, featuring also invisible water repellent treatment.

The SW215A is processed by 40bit, 96kHz floating point CORE DSP and powered by DA SERIES digital power modules, a new generation of CLASS D power amplifier with digitally-controlled SMPS. The DA module employed for powering the SW215A delivers in an ultra-compact package a maximum power of 2000W.

TECHNICAL SPECIFICATION

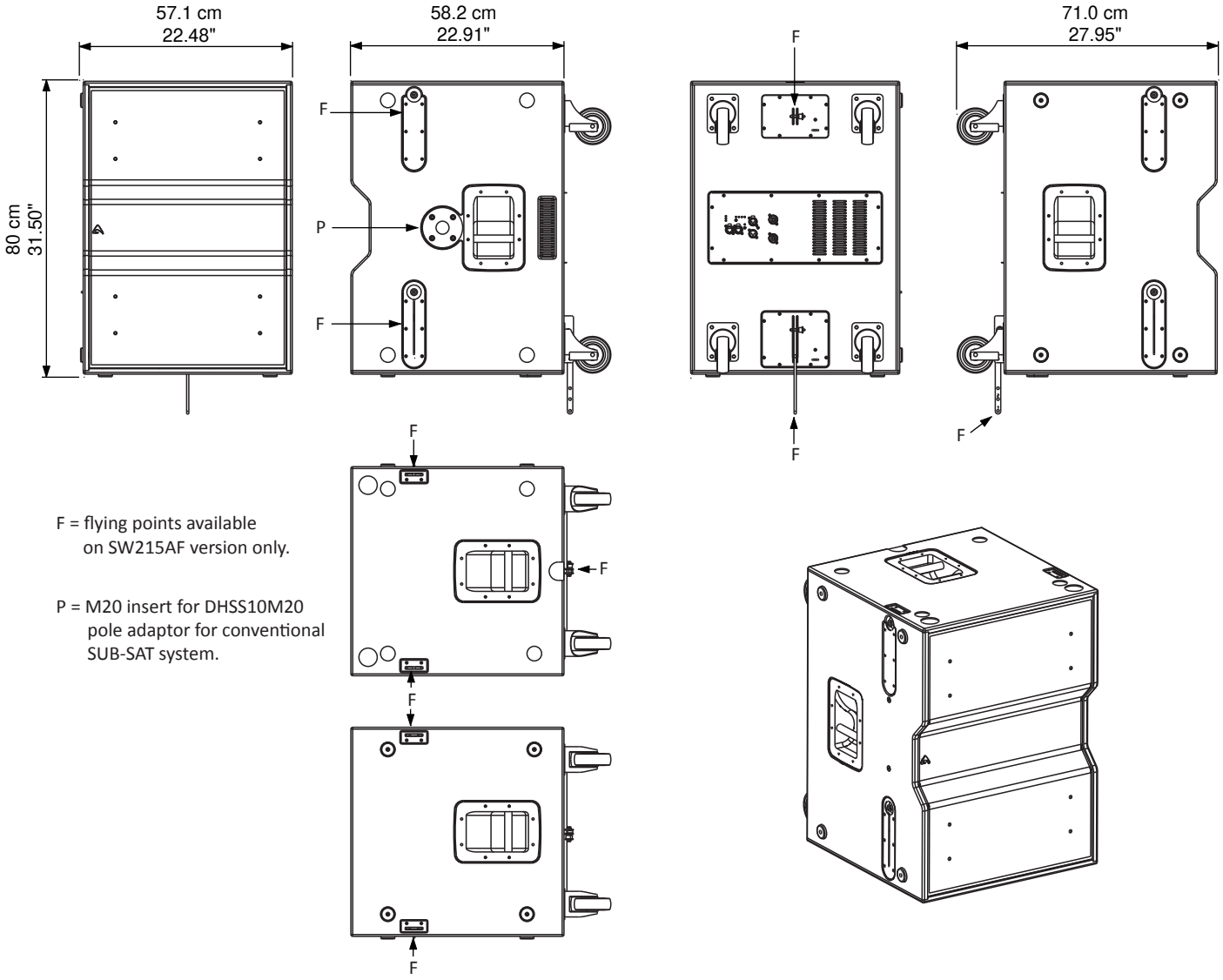
Acoustical	
System type	Manifolded Band Pass
Transducer	Two 15" (380 mm), 3" (75 mm) VC, High stiffness water repellent reinforced cone, Flux Demodulating Ring VC, Double Centering Spider Suspension
Frequency response (±3 dB)	39 Hz – 100 Hz (Processed)
Maximum Peak SPL @ 1m	139 dB
Electrical	
Input Impedance	20 kΩ balanced
Input Sensitivity	+4 dBu / 1.25 V
Signal Processing	CORE processing, 96kHz / 40bit floating point SHARC DSP, 24 bit AD/DA converters
Direct access Controls	4 Presets: Standard, InfraSub, Cardioid, User. Network Termination, GND Link
Remote Controls	PRONET control software
Network protocol	CANBUS
Output Power	1000 W + 1000 W

Amplifier Type	Class D with Variable Switching Frequency and SMPS
Mains Voltage Range (Vac)	230 V~ ±15% or 115 V~ ±15% 50/60 Hz
Mains Connector	PowerCon® (NAC3MPA + NAC3MPB)
Consumption*	700 W (nominal) 1700 W (max)
IN / OUT Connectors	Neutrik XLR-M / XLR-F
IN / OUT Network Connectors	ETHERCON® (NE8FAV)
Mechanical	
Width	571 mm (22.48")
Height	800 mm (31.50")
Depth	582 mm (22.91")
Depth Including Wheels	710 mm (27.95")
Construction	15 mm, reinforced Phenolic Birch
Paint	High resistance, water based paint
Wheels	4 heavy-load 100 mm ø
Transport	4 handles
Side Suspension	High Strength Steel with ¼ Fast Pin (SW215AF)
Back Suspension	High Strength Steel with ¼ Fast Pin (SW215AF)
Net Weight	64.5 Kg (142 lb) SW215A - 68.5 Kg (151 lb) SW215AF

** Nominal consumption is measured with pink noise with a crest factor of 12 dB, this can be considered a standard music program.*

AXIOM

MECHANICAL DRAWING



F = flying points available on SW215AF version only.

P = M20 insert for DHSS10M20 pole adaptor for conventional SUB-SAT system.

OPTIONAL ACCESSORIES

NAC3FCA	Neutrik Powercon® BLUE PLUG
NAC3FCB	Neutrik Powercon® WHITE PLUG
NE8MCB	Neutrik Ethercon PLUG
NC3MXXBAG	Neutrik XLR-M
NC3FXXBAG	Neutrik XLR-F

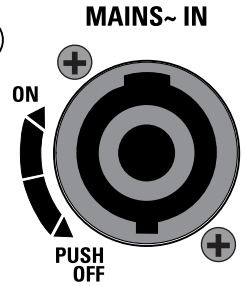
AX2065A	Active vertical array loudspeaker
USB2CAN	PRONET network converter
KPTSW215	Fly bar for Axiom AX2065 and SW215 Loudspeakers
DHSS10M20	Sub-Speaker ø35mm Pole with M20 screw

*see **www.proel.com** for detailed description and other available accessories.*

SPARE PARTS

AC103GS	100 mm Swivel castor without brake
AC115DN	Black steel handle
98AXM215SW8	15'' woofer - 3" VC - 8 ohm
NAC3MPA	Neutrik Powercon® BLUE SOCKET
91AMDSW215	Amplifier module assembly

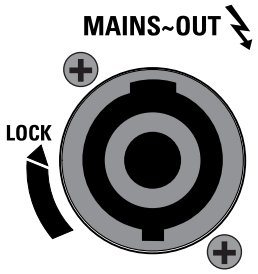
I/O AND CONTROL OPERATIONS



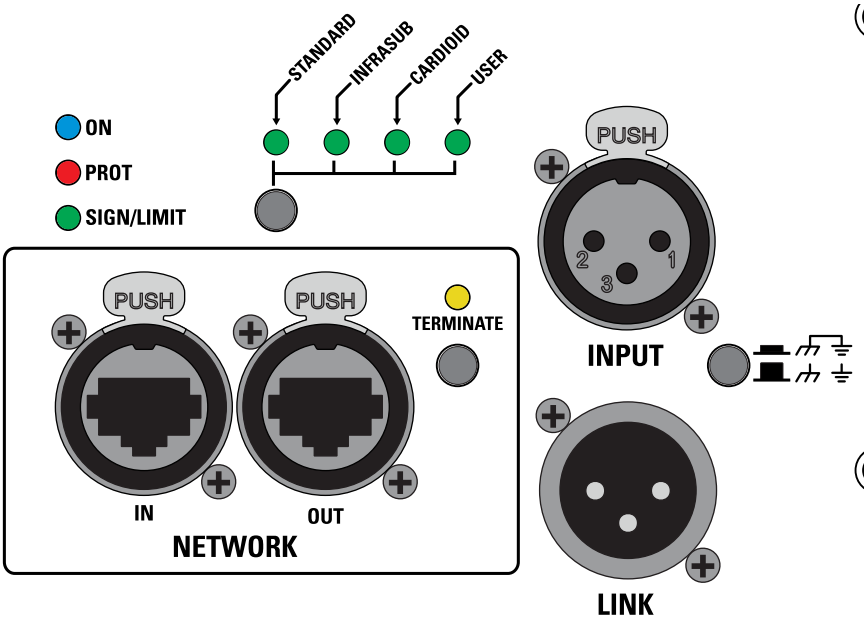
MAINS IN - Powercon® NAC3FCA power input connector (blue). To switch the amplifier on, insert the Powercon® connector and turn it clockwise into the ON position. To switch the amplifier off, pull back the switch on the connector and turn it counter-clockwise into the POWER OFF position.

WARNING! In the case of product failure or fuse replacement, disconnect the unit completely from the mains power. The power cable must only be connected to a socket corresponding to the specifications indicated on the amplifier unit. The power supply must be protected by a suitably rated thermo-magnetic breaker. Preferably use a suitable switch to power on the whole audio system leaving the Powercon® always connected to each speaker, this simple trick extend the life of the Powercon® connectors.

MAINS OUT - Powercon® NAC3FCB power output connector (grey). This is connected in parallel with the MAINS ~ / IN. The maximum load applicable depends on the mains voltage. With 230V~ we suggest to link a maximum of 4 SW215A loudspeakers, with 120V~ we suggest to link at maximum of 2 SW215A loudspeaker.



ON - This LED indicates power on status.
PROT - This red LED lights when the amplifier module is in protect mode for an internal fault and, consequently, the amplifier is muted.
SIGN LIMIT - This LED lights in green to indicate the presence of the signal and lights in red when an internal limiter reduces the input level.
INPUT - Audio signal input with locking XLR connector. It has a fully electronically balanced circuitry including AD conversion for the best S/N ratio and input headroom.
LINK - A direct connection from the input connector to link other speakers with same audio signal.
GND LIFT - This switch lift the ground of the balanced audio inputs from the earth-ground of the amplifier module.
PRESET BUTTON - This button has two function:



1) Pressing it while powering on the unit:

ID ASSIGN the internal DSP assigns a new ID to the unit for the PRONET remote control operation. Each loudspeaker must have a unique ID to be visible in the PRONET network. When you assign a new ID, all the other loudspeakers with the ID already assigned must be ON and connected to the network.

2) Pressing it with the unit ON you can select the DSP PRESET. The selected PRESET is indicated by the corresponding LED:

STANDARD This PRESET is suitable for any application where low frequency reinforcement is required. It features a 90Hz cut off frequency and it can be used in almost any environment in combination with any vertical arrays.

INFRA This PRESET can be used when a deeper bass response is required (Note that when this preset is used the sound pressure level of the system is slightly reduced). NOTE: INFRA and STANDARD PRESET must NOT be used together in close units.

CARDIOID This special PRESET, combined with the STANDARD PRESET, gives the advantage to reduce the low frequencies at the back of an array of three subs, in order to obtain a more comfortable level for the performers on the stage without losing level for the the audience in front of the array. The cardioid configuration is also useful in situation where you want to reduce the bass frequency feedback due to many microphones on stage, for example for acoustic and jazz ensemble, classic orchestra, musicals. Further in this manual you can find some example how to set up a cardioid array.

USER This LED lights when the USER PRESET is loaded. This preset corresponds to USER MEMORY no. 1 of the DSP and, as a factory setting, it's the same to STANDARD. If you want to modify it, you have to connect the unit to a PC, edit the parameters with PRONET software and save the PRESET into USER MEMORY no. 1.

NETWORK IN/OUT - These are a standard RJ45 CAT5 connectors (with optional NEUTRIK NE8MC RJ45 cable connector carrier), used for PRONET network transmission of remote control data over long distance or multiple unit applications.
TERMINATE - In a PRONET network the last loudspeaker device must be terminated (with an inner load resistance) especially in a long run cabling: press this switch if you want to terminate the unit.

POWER AMPLIFIERS

The SW215A is powered by DA SERIES digital power modules, a new generation of CLASS D power amplifier with digitally-controlled SMPS.
The innovative technology used for these amplifiers (including also the use of a variable switching frequency) offers performances at the top of the range, such as a superior sound definition at any audio frequency, very high dynamics also for low level signals and very low distortion even at the maximum power The superior sound quality can be compared with top-of-the-range AB-class analog systems, while the DA modules feature a higher dynamics, very compact size and light weight and efficiency above 90%. The two DA modules employed for powering the SW215A deliver in an ultra-compact package a maximum power of 2000W.

SIGNAL PROCESSING

The system processing is based on the CORE DSP platform, which has been designed by the PROEL R&D Laboratories using one of the most advanced SHARC DSP for audio application. It features 40bit, 96kHz floating point resolution and high quality 24bit AD/DA converters, for a perfect signal integrity, a dynamic range in excess of 110dB and a superior sonic performance. Thanks to its massive processing power, the CORE platform is capable of providing the most sophisticated algorithms for speaker processing, together with remote control and networking capability.
The PRONET control software, working on a solid and reliable CANBUS based network protocol, provides an intuitive interface for the remote control of the whole system, with the possibility of eqing, delaying, increasing the protections and monitoring the status of the amplifier.

PRONET

PRONET software has been designed by Proel's Research & Development Department to easily control a single unit or a network of devices, like active loudspeakers or speaker processors, equipped with the C-AUDIO CORE digital processing platform.
PRONET has been developed in collaboration with sound engineers and sound designers, in order to offer an "easy-to-use" tool to setup and manage your audio system. With PRONET you can visualize signal levels, monitor internal status and edit all the parameters of each connected device.

Download the PRONET app from the PROEL website at http://www.proel.com clicking on support / download section.

The SW218A loudspeaker devices can be connected using the network connection, in this case the PROEL USB2CAN converter optional accessory is needed. The first time you connect a device with the USB2CAN converter, Windows O.S. will ask you to install the driver files, which you can find in the Driver folder within the Pronet application folder (by default is C:\Program Files\Proel\Pronet\Driver, or if you changed it <your path>\Driver). Please refer also to "Installation" and "Drivers" paragraphs in the Pronet documentation.
The PRONET NETWORK is based on a robust, reliable and fast communication protocol called CANBUS. The devices in a PRONET NETWORK are connected together with a "linear bus topology". The USB2CAN converter must be connected to the network input of the first device, the network output of the first device is connected to the input of the second and so on. For the network connections simple RJ45 cat.5 or cat.6 ethernet cables can be used (please don't confuse a ethernet network with a PRONET network these are completely different and must be fully separated also both use the same kind of cable).
The beginning and the end of a PRONET NETWORK must be terminated. One side is terminated by the USB2CAN converter, the other side must be terminated pressing the TERMINATE switch on the last device. All devices between these two points must have the TERMINATE switch lifted.

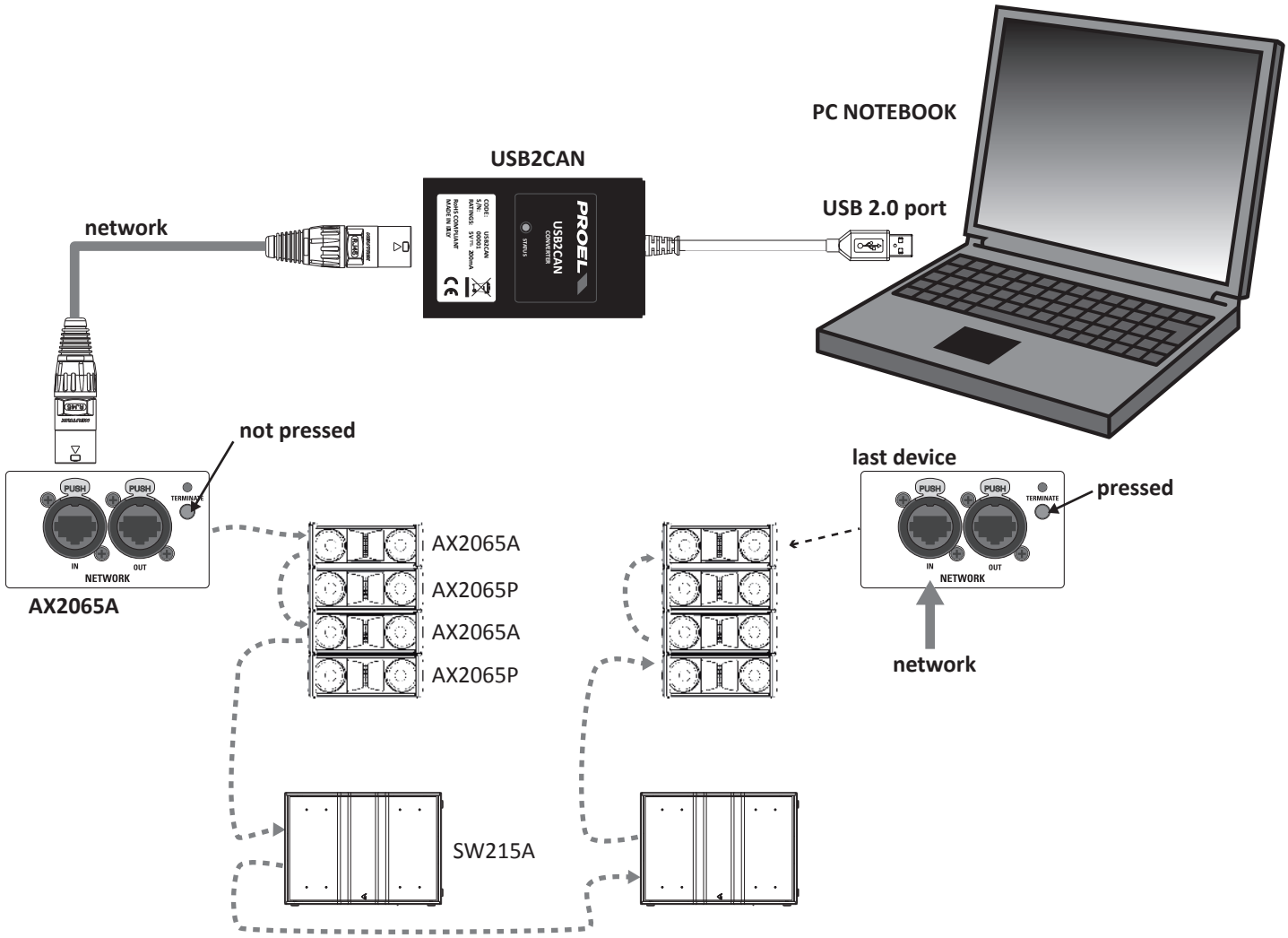
Assign the ID number

To work properly in a PRONET network each connected device must have a unique identifier number, called ID. By default the USB2CAN PC controller has ID=0 and there can be only one PC controller. Every other device connected must have its own unique ID equal or greater than 1: in the network cannot exist two devices with the same ID.
An ID number is assigned automatically to each devices when they are turned on for the first time connected to a network.
In order to correctly assign a new available ID to each device for working properly in a Pronet network, follow these instructions:

1. Switch off all the devices.
2. Connect them correctly to the network cables.
3. "TERMINATE" the latest device in the network connection.
4. Switch on the first device keep pressed "PRESET" button on the control panel.
5. Leaving the previous device switched on, repeat the previous operation on the next device, until the latest device is turned on.

The "Assign ID" procedure for a device makes the internal network controller to perform two operations: reset the current ID; search the first free ID in the network, starting from ID=1. If no other devices are connected (and powered on), the controller assume ID=1, that is the first free ID, otherwise it searches the next one left free.
These operations ensure that every device has it's own unique ID, if you need to add a new device to the network you simply repeat the operation of step 4. Every device maintains its ID also when it is turned-off, because the identifier is stored in the internal memory and it is cleared only by another "Assign ID" step, as explained above. This means that if your network is made always of the same devices the assigning ID procedure must be executed only the first time the system is turned on.
For more detailed instruction about PRONET see the PRONET USER'S MANUAL included with the software.

EXAMPLE OF PRONET NETWORK WITH AX2065A AND SW215A



Useful tools to set up properly a vertical array system using the SW215A subwoofer
This is a list of tools that can be very useful to set properly a vertical array system with the SW215A active subwoofers.

CABLE TESTER
It is a good practice to check all cables before each installation, because even one faulty cable can compromise heavily the system performance.

INCLINOMETER WITH LEVER
This tool can be used to verify the vertical array angle. It can be used at the top or at the bottom of the array In this case you have to sum all splay angles, so the maximum precision is needed for aiming the vertical array, particularly for long throw applications.

LASER DISTANCE METER
This instrument can be useful to measure the height of the vertical array and to know the distance between FOH-Subs and FOH-Array for setting the delay time.

SMAART or similar acoustic measurement system
These are useful to measure delays, phase and response of the system.

PRESET

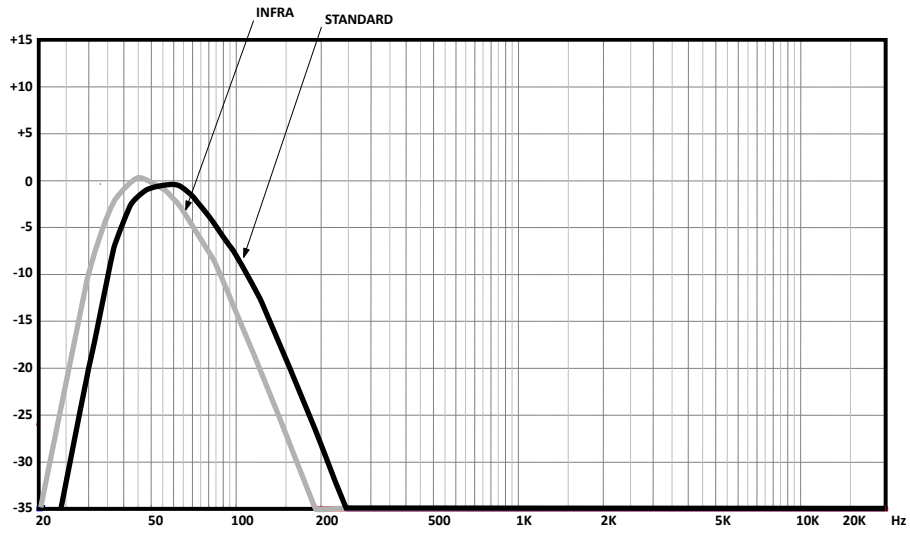
The SW115A has three factory presets already stored inside the CORE DSP, these preset are ready to use the sub in combination with AX2065A vertical array loudspeaker or any other professional audio system:

STANDARD PRESET: the response starts at 45Hz and the cutoff is at 100Hz with LR 24dB/oct., use this preset for almost any application at ground stack and it must be used with the SW215AF set as flown (see FLOWN SET UP).

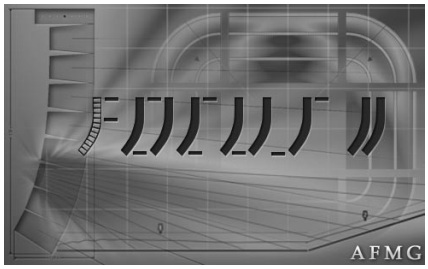
INFRASUB PRESET: the response starts at 39Hz and the cutoff is at 60Hz with LR 24dB/oct., use this preset when a very deep bass response is required, it must be used at ground stack only, alone or in combination with some other boxes set as STANDARD, absolutely do not use it in combination of CARDIOD preset. NOTE: INFRA and STANDARD PRESET must NOT be used together in close units.

CARDIOD PRESET: the response of this preset is the same of STANDARD preset but when combined together as described further the sub stack is capable to cancel tha bass in the backwards, absolutely it must be used in combiantion of other two boxes and at ground stack.

SW215A - PRESET RESPONSE



AIMING and SUSPENDING INSTRUCTIONS (SW215AF only)



PREDICTION: EASE Focus 2

To aim correctly a complete system we suggests to use always the Aiming Software - **EASE Focus 2**:

The **EASE Focus 2 Aiming Software** is a 3D Acoustic Modelling Software that serves for the configuration and modelling of Line Arrays and conventional speakers close to reality. It only considers the direct field, created by the complex addition of the sound contributions of the individual loudspeakers or array components.

The design of EASE Focus is targeted at the end user. It allows the easy and quick prediction of the array performance in a given venue. The scientific base of EASE Focus stems from EASE, the professional electro- and room acoustic simulation software developed by AFMG Technologies GmbH. It is based on the EASE GLL loudspeaker data file required for its use: **AXIOM_AX Series_v2_0.GLL**, please note that the version must be 2.0 or more. The GLL file contains the data that defines the Line Array with regard to its possible configurations as well as to its geometrical and acoustical properties. For detailed explanation of how to use the software and how to obtain a correct aiming refer to EASE Focus documentation and other on-line manuals (http://focus.afmg.eu/index.php/fc-software-en.html).

WARNING! CAREFULLY READ THE FOLLOWING INSTRUCTIONS AND CONDITION OF USE:

- This loudspeaker is designed exclusively for Professional audio applications. **The product must be installed by qualified personal only**.
- Proel strongly recommends that this loudspeaker cabinet be suspended taking into consideration all current National, Federal, State and Local regulations. Please contact the manufacturer for further information.
- Proel do not accept any liability for damage caused to third parties due to improper installation, lack of maintenance, tampering or improper use of this product, including disregard of acceptable and applicable safety standards.
- During assembly pay attention to the possible risk of crushing. Wear suitable protective clothing. Observe all instructions given on the rigging components and the loudspeaker cabinets. When chain hoists are in operation ensure that there is nobody directly underneath or in the vicinity of the load. Do not under any circumstances climb on the array.

FLOWN SET UP (SW215AF only)

Suspending the sub-woofers has different advantages and some incovenient. One incovenient is that it's not possible to use the cardioid configuration, while another one is that as the sub-woofers don't couple with the ground and indoor usage can have different behaviours depending on ceiling and walls. The advantages are that the space underneath the stage can be free from subs, the coupling between sub and sat is better and, using a column of 4-6 sub boxes, the basses can be steered more deeply into the audience with a more uniform distribution of the low frequencies.

The SW215AF subwoofers can be suspended alone or at the top of a vertical array of AX2065A loudspeakers using the KPTSW215 fly bar. The boxes are linked together in a column using a series of couplers integrated in the frame of each enclosure. Each system can be set properly both acoustically and mechanically, using the aiming software.

Coupling the system in the front does not require any adjustment: using two locking pins, each loudspeaker box is fixed to the previous. The slotted bar in the back is inserted in a U-shaped frame that features a series of numbered holes. Sliding the slotted bar in the U-shaped frame of the next loudspeaker and inserting a locking pin in one of the numbered holes, it is possible to adjust the relative splay angle between two adjacent

loudspeakers in the array column.

KPTSW215 fly bar maximum capacity is 540 Kg (1190 lbs) with the 0° angle. It can support, with a safety factor of 10:1, up to:

- **8 AX2065A + 8 AX2065P (flybar from 0° to 10°)**
- **12 AX2065A (flybar from 0 to 10°)**
- **2 SW215AF + 4 AX2065A + 4 AX2065P (flybar at 0°)**
- **2 SW215AF + 8 AX2065A (flybar at 0°)**
- **6 SW215AF (flybar from 0° to 5°)**

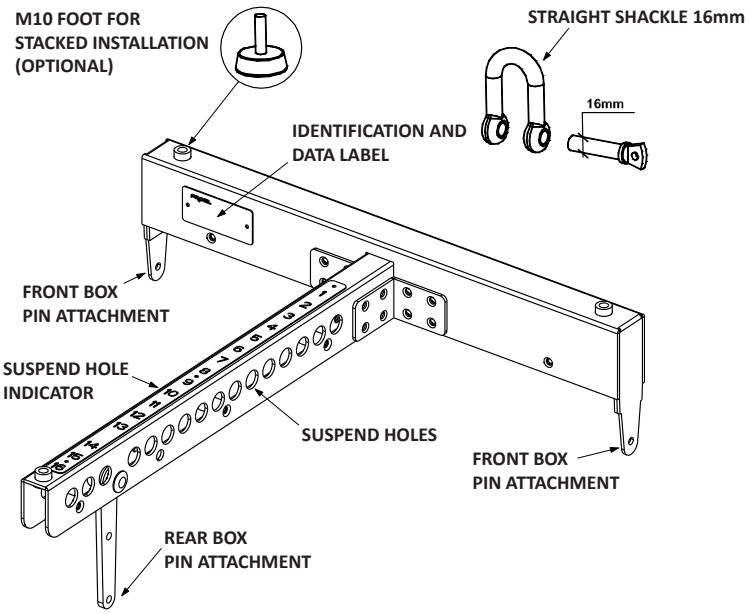
Follow the sequence in the figure for fixing the fly bar at the first box. Usually this is the first step before lifting up the system. Be careful to insert properly all the locking pins (1)(2) and (3)(4) then the shackle (5) in the right holes as specified by the aiming software.

When lifting the system always proceed gradually step by step, paying attention to secure the fly bar to the box (and the box to the other boxes) before pulling up the system: this makes easier to insert properly the locking pins. Also when the system is released down, unlock gradually the pins.

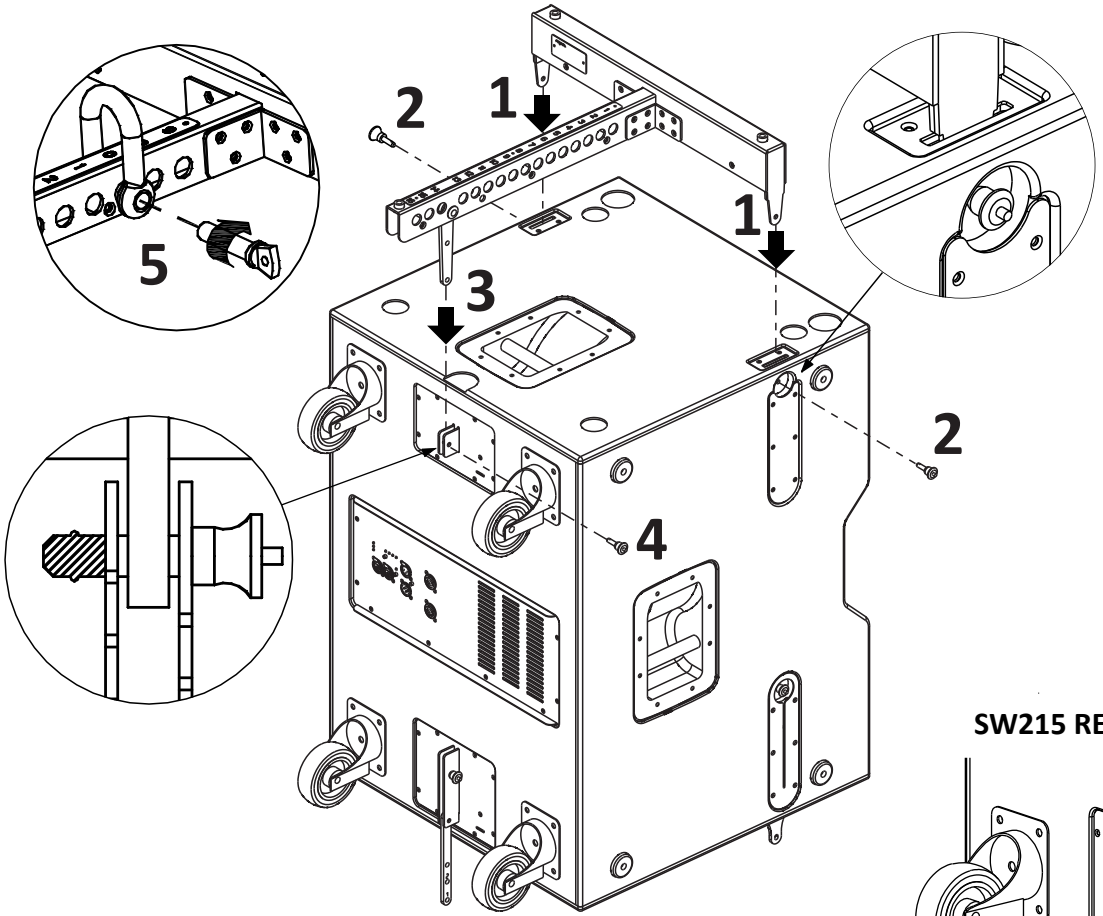
During the lifting be very careful to not let the cables enter the space between one enclosure and the other, as their compression could cut them.

Please note that the Rear Link Bar of the SW215 cabinet has two holes (see figure): the hole signed as nr.1 must be used for SW215-SW215 sub-sub link, hole signed as nr.2 must be used for SW215-AX2065 sub-sat link.

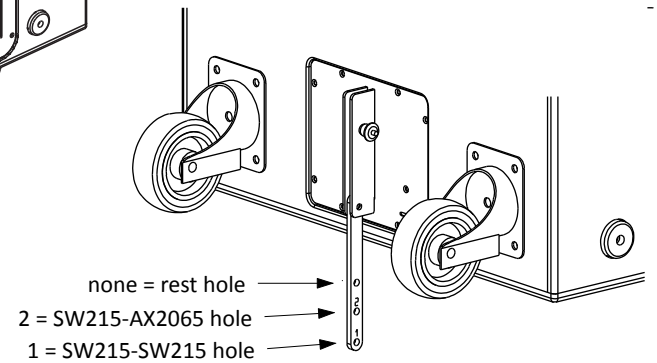
KPTSW215 FLY BAR AND ACCESSORIES



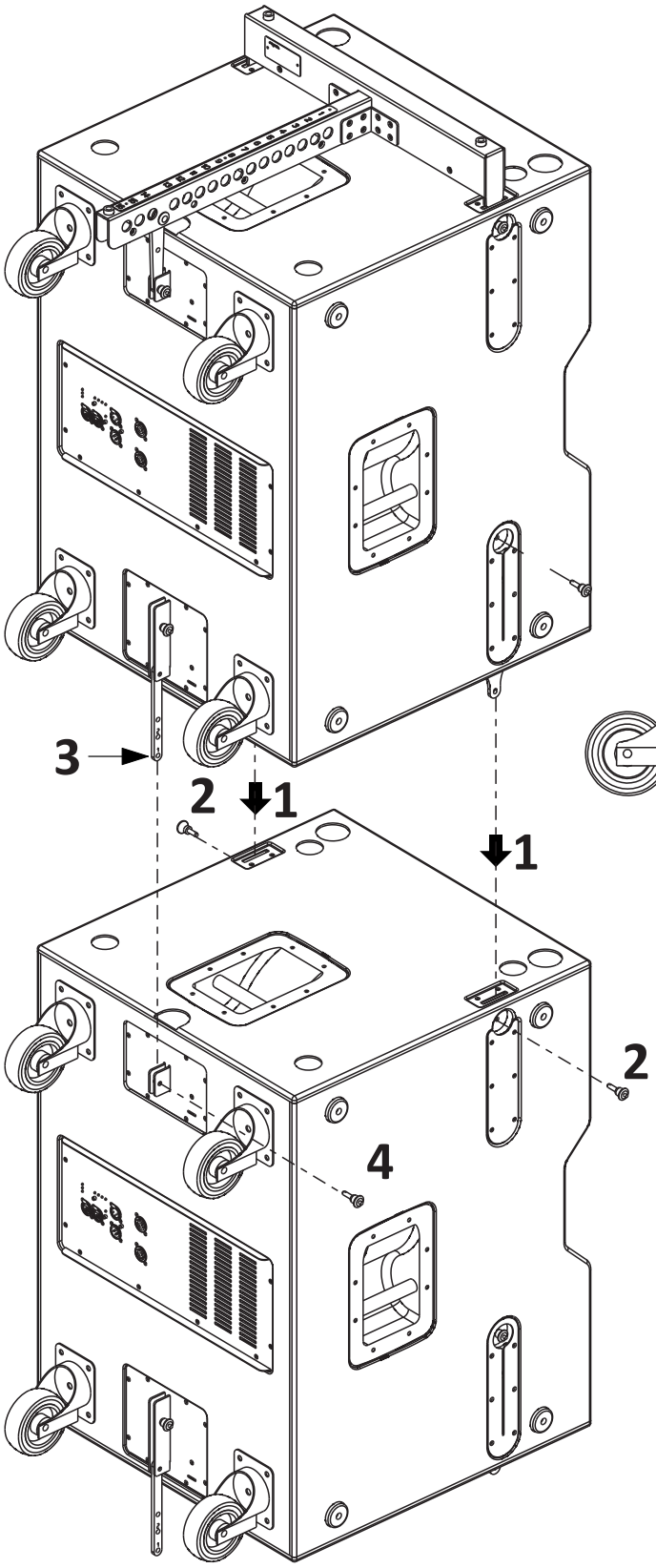
KPTSW215 FLY BAR ASSEMBLY SEQUENCE



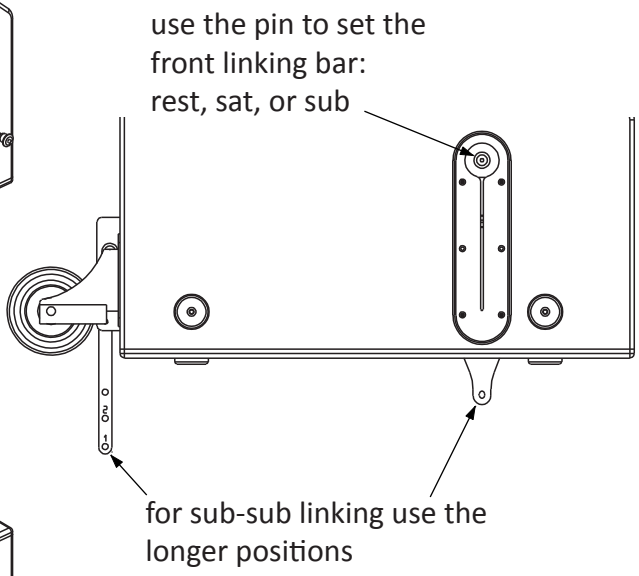
SW215 REAR LINK BAR



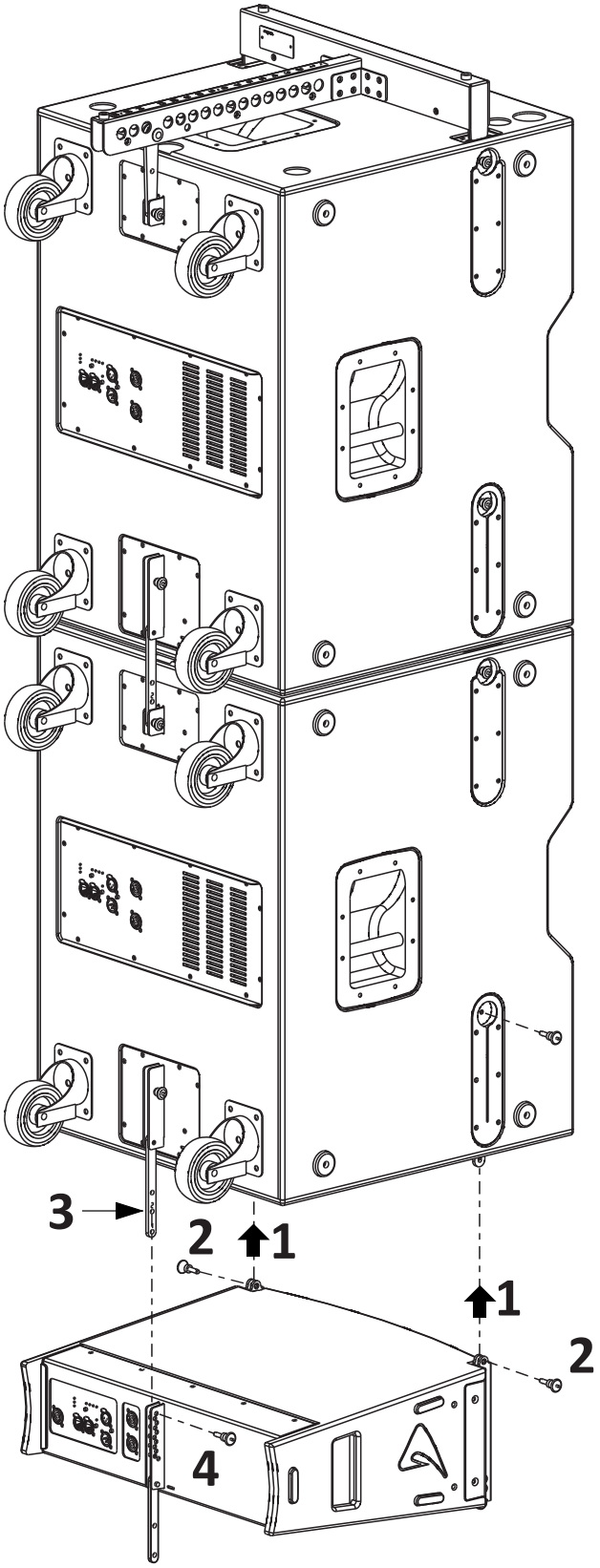
KPTSW215 - SW215AF ARRAY ASSEMBLING SEQUENCE



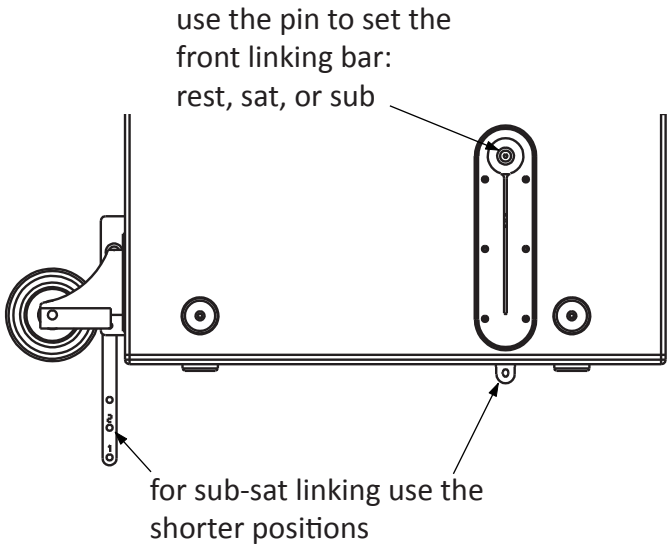
MAX:
KPTSW215
+
6x SW215AF



KPTSW215 - SW215AF - AX2065A ASSEMBLING SEQUENCE



MAX:
KPTSW215
+
2x SW215AF
+
4x AX2065A
+
4x AX2065P

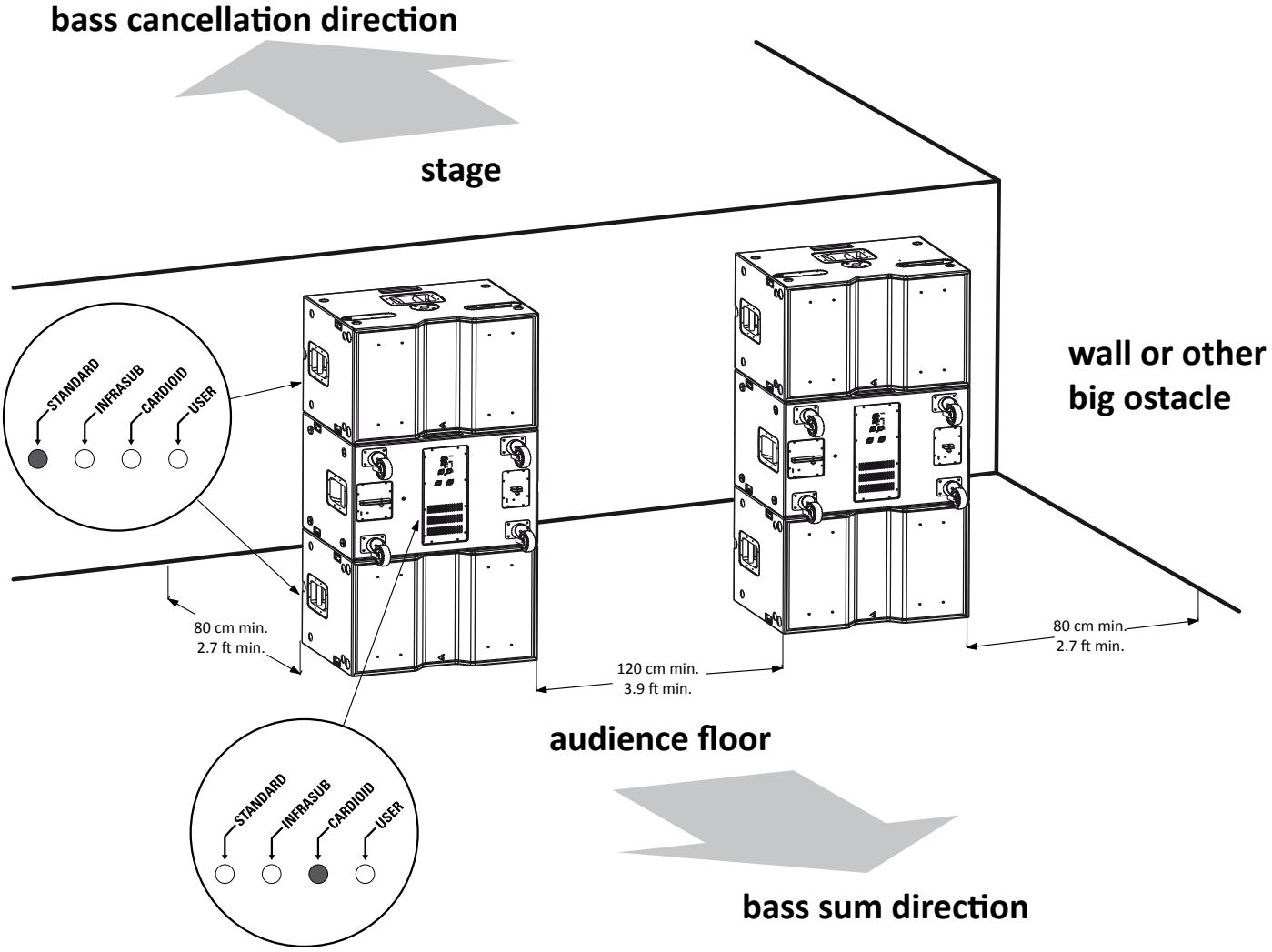


CARDIOID SET UP

The cardioid preset must be used in a sub array of three SW215A. Two box must be oriented towards the audience and one must be turned in the opposite direction (typically the box in the centre of the array). The bottom and the top boxes must have the STANDARD PRESET, the box in the middle must have the CARDIOID PRESET. The audio signal sent to all boxes is the same.

The CARDIOID PRESET has the same response of the STANDARD PRESET, but to obtain the maximum cancellation on the back side of the array it has the phase inverted and a proper level and delay setting.

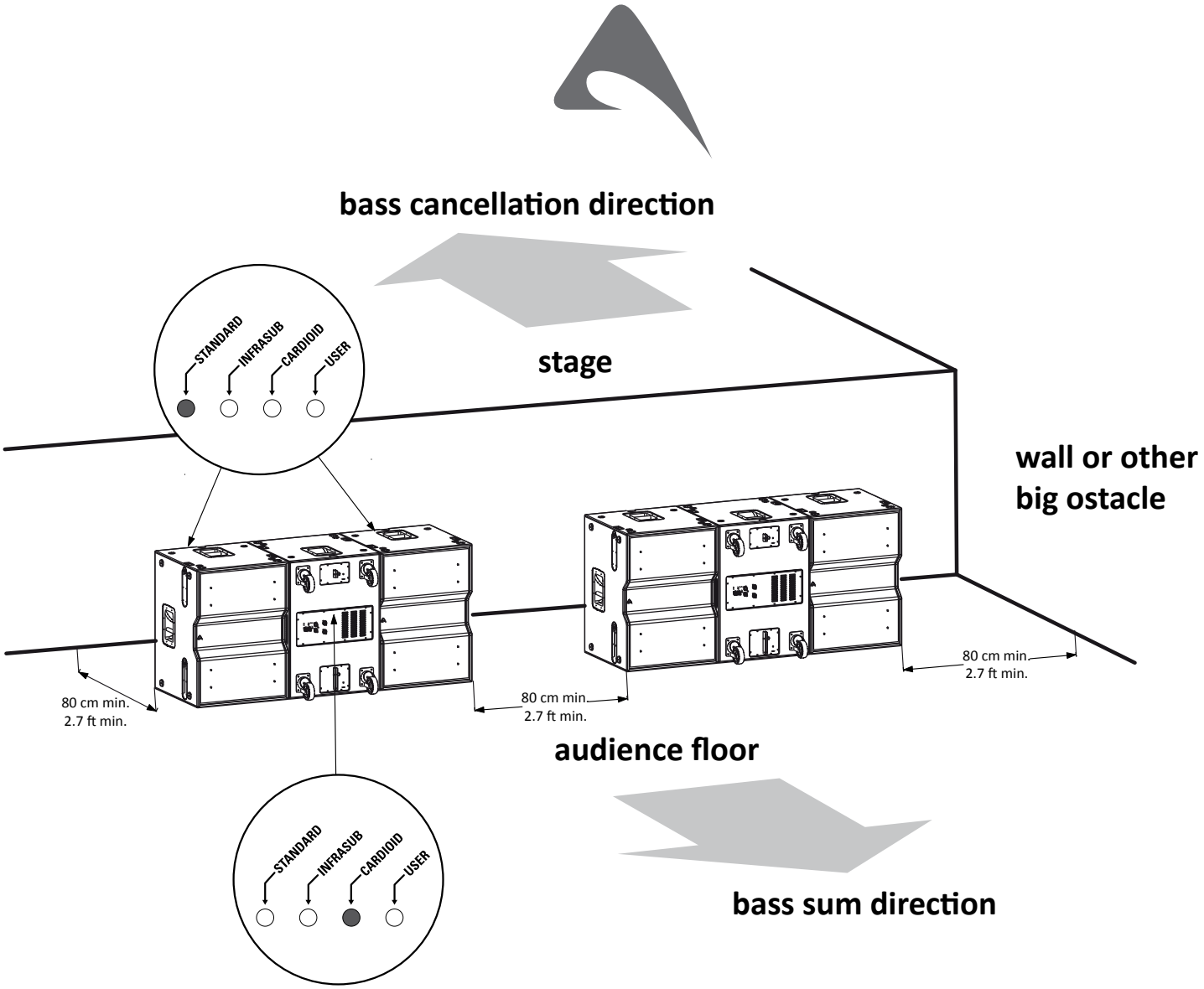
The figure below shows two typical displacement of the array. The first with all the boxes in horizontal position for a total height of 1713 mm and a width of 800 mm. The second one with all the boxes in vertical position for a total height of 800 mm and a width of 1713 mm.



NOTES:

When placing the cardioid array keep a distance to walls or other obstacles of at least 80 cm (2.6 ft) in order not to affect the radiation of the reversed cabinet.

When placing multiple cardioid arrays keep a distance between them of at least 120 cm (3.9 ft) in order not to maximize the combined radiation of whole arrays.



NOTES:
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When placing multiple cardioid arrays keep a distance between them of at least 80 cm (2.6 ft) in order not to maximize the combined radiation of whole arrays.

LIMITED WARRANTY

Proel warrants all materials, workmanship and proper operation of this product for a period of two years from the original date of purchase. If any defects are found in the materials or workmanship or if the product fails to function properly during the applicable warranty period, the owner should inform about these defects the dealer or the distributor, providing receipt or invoice of date of purchase and defect detailed description. This warranty does not extend to damage resulting from improper installation, misuse, neglect or abuse. Proel S.p.A. will verify damage on returned units, and when the unit has been properly used and warranty is still valid, then the unit will be replaced or repaired. Proel S.p.A. is not responsible for any “direct damage” or “indirect damage” caused by product defectiveness.

• This unit package has been submitted to ISTA 1A integrity tests. We suggest you control the unit conditions immediately after unpacking it.
• If any damage is found, immediately advise the dealer. Keep all unit packaging parts to allow inspection.
• Proel is not responsible for any damage that occurs during shipment.
• Products are sold “delivered ex warehouse” and shipment is at charge and risk of the buyer.
• Possible damages to unit should be immediately notified to forwarder. Each complaint for package tampered with should be done within eight days from product receipt.

SAFETY INSTRUCTIONS

– To reduce the risk, close supervision is necessary when the product is used near children.
– Protect the apparatus from atmospheric agents and keep it away from water, rain and high humidity places.
– This product should be site away from heat sources such as radiators, lamps and any other device that generate heat.
– This product should be located so that its location or position does not interfere with its proper ventilation and heating dissipation.
– Care should be taken so that objects and liquids do not go inside the product.
– The product should be connected to a power supply mains line only of the type described on the operating instructions or as marked on the product. Connect the apparatus to a power supply using only power cord included making always sure it is in good conditions.
– WARNING: The mains plug is used as disconnect device, the disconnect device shall remain readily operable.
– Do not cancel the safety feature assured by means of a polarized line plug (one blade wider than the other) or with a earth connection.
– Make sure that power supply mains line has a proper earth connection.
– Power supply cord should be unplugged from the outlet during strong thunderstorm or when left unused for a long period of time.

CE CONFORMITY

Proel products comply with directive 2004/108/EC (EMC), as stated in EN 55103-1 and EN 55103-2 standards and with directive 2006/95/CE (LVD), as stated in EN 60065 standard.

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